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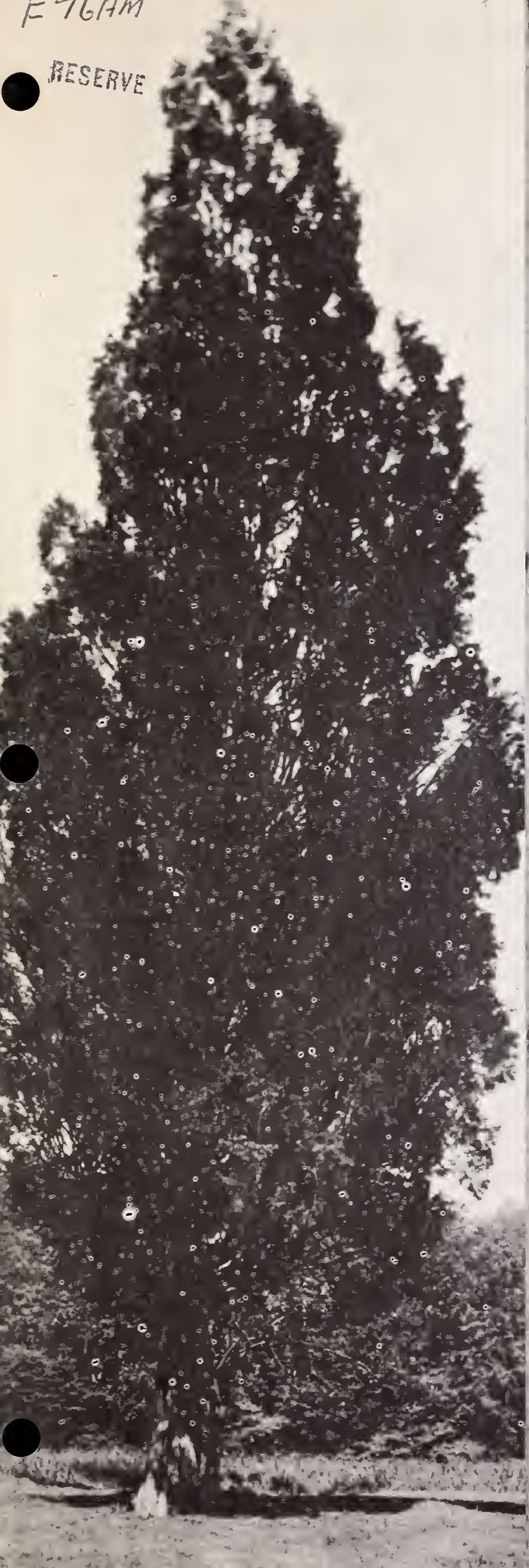

EASTERN REDCEDAR

. . . an American wood

Eastern redcedar is the most widely distributed tree-sized conifer in the Eastern United States. Its range also extends into southeastern Canada. "The wood has a fine, uniform, straight grain, and is favored because of its exceptional cutting qualities, durability, rich color, and aroma." It is used mainly for Christmas trees, fenceposts, pencil slats, and, because of its aromatic odor, for chest, wardrobe, and closet linings.

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June 1974
U.S. Department of Agriculture Forest Service

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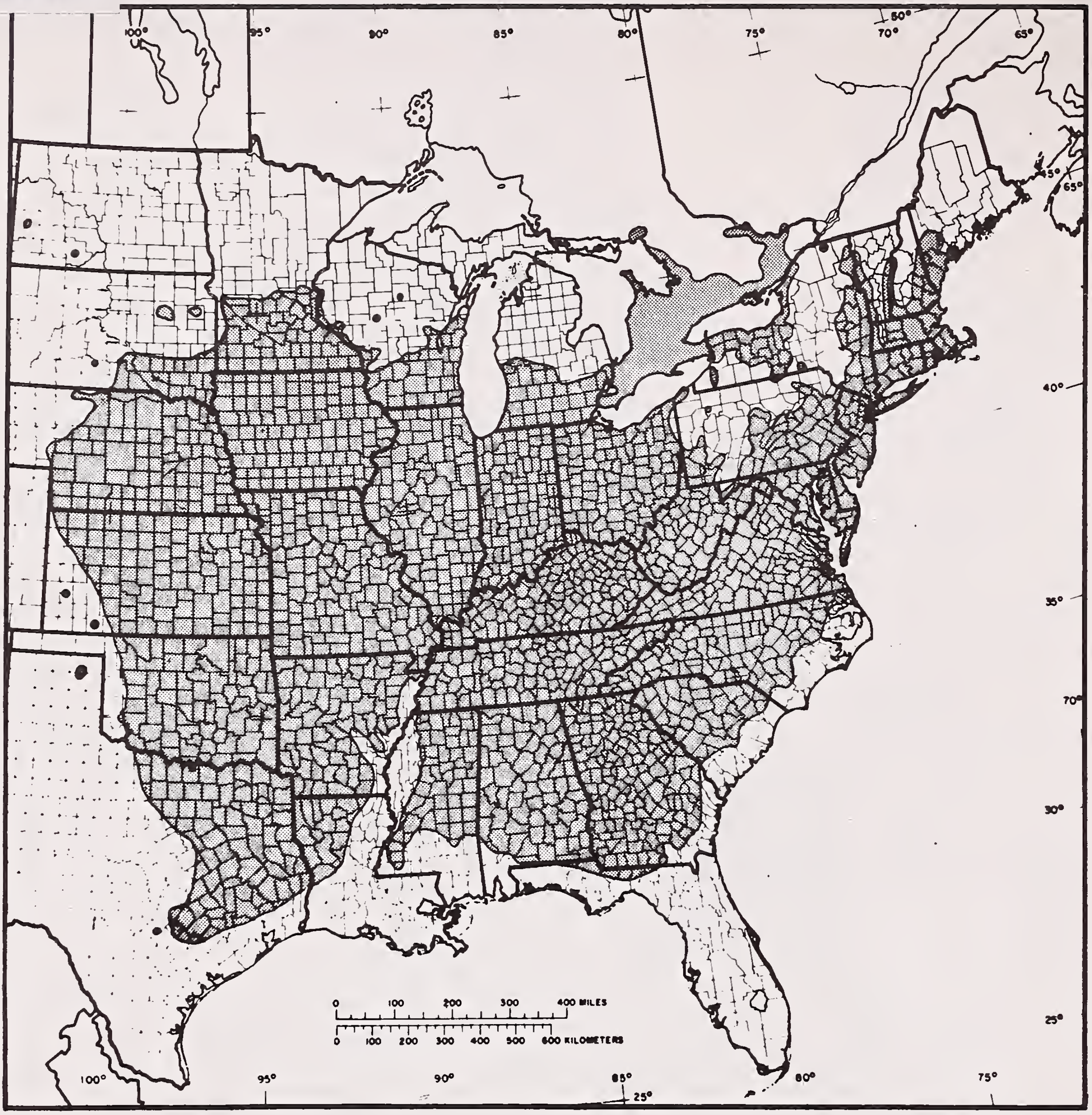

Figure 1.—Natural range of eastern redcedar. F–512372

COVER: Eastern redcedar F–24098

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EASTERN REDCEDAR

~~. . . an American wood~~

E~~dwin~~ R. Ferguson and Edwin R. Lawson[1]

DISTRIBUTION

Eastern redcedar (*Juniperus virginiana* L.) grows in every State east of the 100th meridian (fig. 1). It also appears in southern Ontario, the southern tip of Quebec, and in some parts of New Brunswick and Nova Scotia. Throughout its range it grows under diverse conditions—in deep and shallow soils, on ridgetops, and in bottoms.

The magnificent stands so often mentioned by early explorers have been cut, and for years redcedar has been primarily confined to fence rows, abandoned fields, and submarginal lands, where it often grows poorly. The species is so frequently associated with limestone ledges that it is commonly believed to grow only on dry, rocky soils. Such sites produce short-bodied trees whose merchantable length rarely exceeds one to two 6½-foot posts. Like most trees, redcedar grows best on deep, moist, well-drained alluvial sites, where its height may reach 55 to 60 feet at 50 years of age. Because of competition from other species, however, it rarely becomes dominant on such sites.

Redcedar is among the first trees to invade abandoned fields and areas cleared for pasture. On deep soils, associated invasion species, such as persimmon and sassafras, may soon crowd it out. Although it grows occasionally in almost pure stands in glades, redcedar is frequently associated with winged elm and blackjack oak.

DESCRIPTION AND GROWTH

Eastern redcedar grows slowly, and long rotations are required to produce conventional saw logs. Trees 20 to 30 years old are generally 18 to 26 feet tall and 2¼ to 3 inches in diameter. Mature trees are small to medium-sized, usually 40 to 50 feet tall with a bole 12 to 24 inches in diameter. On good sites they may reach 120 feet in height and 4 feet in diameter. On dry sites in the prairies region, trees 110 years old are often less than 20 feet tall. Growth rates are improved by removal of competing vegetation.

The bark is very thin and peels in long, shreddy strips (fig. 2). Radial growth is extremely irregular, and for this reason the trunk may be more or less grooved. The tree is variable in form; the crown may be columnar or pyramidal, with the branches ascending, wide-spreading, or even pendulous.

Tiny evergreen leaves are borne in two forms. Those on seedlings and vigorous twigs are sharp, pointed, and awl-shaped (fig. 3). On less vigorous stems, closely overlapping scalelike leaves fit tightly against the twig in opposite pairs. Scalelike leaves are usually about ${}^{1}\!/_{16}$-inch long and dark blue-green; they turn russet or yellow-brown during the winer.

From February to May small inconspicuous male and female flowers appear at the ends of minute twigs—almost always on separate trees. The small, pollen-bearing catkins often give the entire tree a golden color. The fruit (fig. 3) is a berrylike cone which is fleshy, dark blue, and highly aromatic. Cones mature in one season, and when ripe are purplish blue covered with a white powdery bloom. They contain two (rarely three or four) small seeds, which number 17,600 to 59,000 to the pound.

Good seed crops occur every 2 or 3 years, with light crops between. The seeds usually germinate in the early spring of the second year after they mature, but a few germinate in the first and third years. Dispersion depends heavily upon small wildlife, which eat the seed in large quantities. Passage through the digestive tract of a bird or animal probably hastens germination.

The thin bark offers little protection against fire. Fortunately, the foliage does not burn readily, and in

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NOTE: This publication supersedes unnumbered publication "Eastern Redcedar," issued 1953.

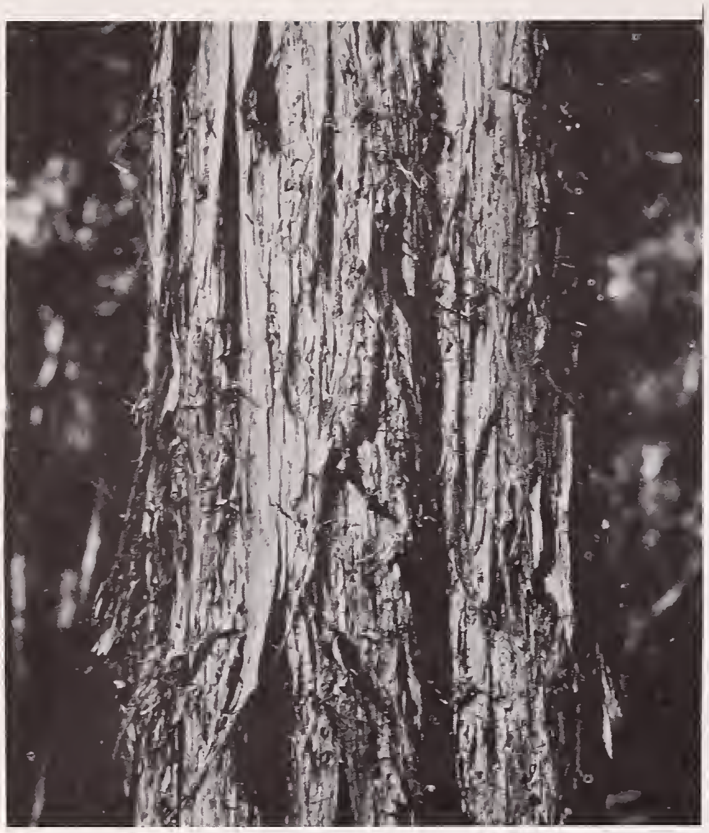

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Figure 2.—Bark of eastern redcedar.

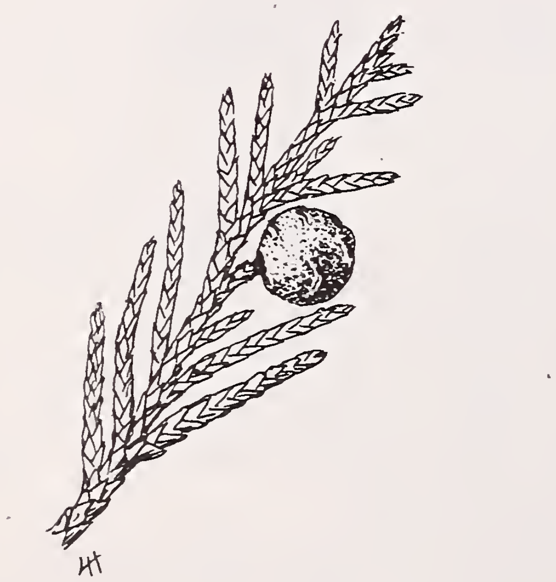

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Figure 3.—Leaves and fruit of eastern redcedar.

stands on thin soils litter accumulation is limited because trees are scattered and small. Thus, the lack of fuel protects many stands in areas where fire-occurrence rate is high. Herbs and native grasses are relatively abundant on cedar glades, which are grazed extensively. Overgrazing by cattle readily damages the shallow soil by increasing compaction, surface runoff, and erosion.

When deer use the twigs and foliage heavily, as sometimes happens during hard winters, browse lines develop on old trees, younger ones become hedged, and most reproduction is destroyed.

Trees are susceptible to the cedar-apple rust, caused by fungi of the genus *Gymnosporangium.* Spindle-shaped swellings on the trunks and large branches are one effect of the disease. Witches-broom growths—compact, bushy formations of part of the foliage—are another. Though rarely fatal to redcedar, the disease is very damaging to apple trees, and no method of checking its effects in orchards has been found. In some States, eradication of all cedars and junipers within a mile of an apple orchard is required by law.

Boring insects sometimes feed on living and dead trees, and bagworms occasionally cause defoliation. Usually, however, insects do not damage redcedar trees badly.

COMMON NAMES

Eastern redcedar is the commonly accepted name for this species, which has been called redcedar, red juniper, Virginia juniper, and savin. Because of its reddish bark and wood, early French colonists called the tree *baton rouge,* meaning red stick.

SUPPLY

The growing-stock volume of eastern redcedar in the United States is estimated at 500 million cubic feet. Tennessee, Kentucky, Alabama, and Arkansas, listed in order, have the greatest amounts—in total, more than one-half of the entire supply. Sawtimber-size trees comprise a volume of about 370 million board feet, of which about half is in Tennessee, Kentucky, Alabama, and Missouri. In addition, South Carolina, North Carolina, Virginia, and Arkansas each have more than 50 million board feet.

Acreage in the redcedar type is 2.0 million. Of this total, about 700,000 acres are in Tennessee and 550,000 in Kentucky, while Missouri, Virginia, and Arkansas each have more than 100,000.

PRODUCTION

Production of eastern redcedar is frequently not reported, or is combined with that of several other softwood species. Conservatively, it is estimated that about 50 million board feet are harvested annually. In addition, approximately 13 million cubic feet of growing-stock trees are removed each year, with most being used for posts. These figures represent about 100 percent of the net annual growth of sawtimber and 45 percent of the annual growth of growing stock.

For a variety of reasons, many farmers harvest redcedar themselves. Their equipment is usually large enough to handle typical logs, and posts are often needed on the farm. Wages from logging are good, and the redcedar volume on most farm woodlots is not large enough to attract a logging contractor. In harvesting, it is usually most profitable to cut as many sawlogs as possible, then convert the remaining material into posts.

Sawlogs are generally bucked into lengths of 8 feet 3 inches, including a trim allowance of 3 inches. Grade specifications permit sound knots, white streaks, and tight, firm pitch, but wood must be sound. Lumber grades are based on the proportion of a board that will yield sound cuttings, with certain limits of length, width, and proportion of sapwood. Variations in thickness are permitted, and odd lengths are admitted without limit.

For small volumes, most mills pay per piece, rather than per board foot. For example, in 1973 representative price for sawlogs 8 feet 3 inches long were:

Top Diameter *Inches*	Price
6	$1.00
8	1.50
10	2.00
12	2.80
14	3.80

Ashe juniper (*Juniperus ashei* Buchholz) posts and other products are often marketed as eastern redcedar in the areas where the two species grow together. Other associated species are usually of too poor quality to be merchantable.

CHARACTERISTICS AND PROPERTIES

Redcedar has whitish sapwood and reddish or reddish-brown heartwood. The number of rings in the sapwood varies with tree age and growth rate: old, slow-growing trees may have 20 to 30 rings and young fast-growing trees 8 to 15. The transition between the sapwood and heartwood is usually abrupt, but there may be a narrow pinkish fringe around the heartwood. Although normally bright and attractive, the unfinished heartwood will darken when exposed to sunlight. Only a small part of the growth ring is summerwood.

The heartwood is highly resistant to decay and to attack from insects, including termites. It also has the property—unique among American woods—of repelling clothes moths.

The wood is characterized by long thin tracheids, resinous parenchyma cells, and fine rays. The vertical tracheids in stemwood have tangential diameters of 15 to 20 micrometers (μm) and radial diameters of 14 to 28 μm. These tracheids usually have somewhat rounded ends with vertical spaces between them. Vertical parenchyma cells are fairly abundant, sometimes occurring in bands, and are generally filled with dark resinous material. The exclusively parenchymatous rays are 2 to 4 cells high in tangential view, rarely exceeding a height of six cells. The dark and conspicuous rays are about 9 to 11 μm wide. Size and numbers of cells and tracheids vary considerably among trees and location within trees. Resin ducts are absent in stemwood, but are present in the primary bark.

Physical and mechanical properties of the wood vary somewhat with local growing conditions. Specific gravity ranges from about 0.44 to 0.50. One determination indicated that a cubic foot of air-dried wood weighed 30.7 pounds. The lightest and softest wood is produced on swampy hummocks in the lower South.

Compression tests parallel to the grain indicate that maximum crushing strength ranges between 395 and 491 kg/cm^2, and averages about 433 kg/cm^2. From 10 observations, Youngs' modulus of compression was 5.18×10^4 kg/cm^2. Shear strength parallel to the grain ranged from 50.0 to 100.0 kg/cm^2 and averaged 73.7 kg/cm^2. Cleavage strength, or load to cause splitting, varied from 20.3 to 34.6 kg/cm and averaged 27.4 kg/cm.

Its physical properties give redcedar wood excellent characteristics. It shrinks very little during drying and is not greatly affected by changes in atmospheric moisture. It is moderate in hardness, but still highly workable. The grain is straight, except when deflected by knots. Knots are harder than surrounding wood, but usually are tight and add to the beauty of most finished products. The wood splits easily, holds nails reasonably well, and has good gluing characteristics. Partly because of its fine texture, it finishes well and can be stained, but it has so much natural beauty that most manufacturers merely apply a clear finish that enhances the color and retards darkening.

PRINCIPAL USES

Because of its durability, redcedar has always been valued for fence posts. Even today this use accounts for most of the wood harvested. Large numbers of young trees are cut for posts before they reach sawlog size.

Its moth-repelling quality makes the wood popular for chests, wardrobes, and closet lining. For this purpose, the boards must be left unfinished.

Redcedar formerly was used extensively for pencil wood, but other species and wood substitutes are taking over. In certain areas, the wood is also in high demand for carving.

Oils distilled from leaves, twigs, and wood are used in the manufacture of perfumes and medicines. The most important oil is cedrol, which can be separated by fractionation into several aromatic compounds. Yield of oil from fresh chips and sawdust is 2 to 3½ percent.

Eastern redcedar ranks among the top five trees used for Christmas trees. This use is very heavy in areas where it occurs abundantly in pastures and fence rows. Redcedar is an important constituent of shelterbelt plantings in the Great Plains. It also helps to prevent erosion in natural stands, especially on very shallow soils. The fruits are food for birds, rabbits, foxes, racoons, skunks, coyotes, and other wildlife. The foliage and twigs are eaten by deer, and are an important source of food during winter when other green plants are scarce. The trees provide cover for many species of wildlife.

REFERENCES

Arend, J. L. and Collins, R. F.
1949. A site classification for eastern redcedar in the Ozarks. Soil Sci. Soc. Am. Proc. 13: 510–511.

Bannan, M. W.
1942. Wood structure of the native Ontario species of Juniperus. Am. J. Bot. 29: 245–252.

Boyce, J. S.
1948. Forest pathology. McGraw-Hill Book Co., 550 p.

Crawford, H. S., Jr.
1961. Eastern redcedar. *In* Deer browse plants of southern forests, p. 34–35. USDA Forest Serv. South. and Southeast. Forest Exp. Stns., New Orleans, La., and Asheville, N. C.

Ferguson, E. R.
1970. Eastern redcedar: an annotated bibliography. USDA Forest Serv. Res. Pap. SO–64, 21 p. South. Exp. Stn., New Orleans, La.

Ferguson, E. R., Lawson, E. R., Maple, W. R., and Mesavage, C.
1968. Managing eastern redcedar. USDA Forest Serv. Res. Pap. SO–37, 14 p. South. Forest Exp. Stn., New Orleans, La.

Read, R. A. and Walker, L. C.
1950. Influence of eastern redcedar on soil in Connecticut pine plantations. J. For. 48, No. 8, Part 1: 337–339.

Sowder, A. M.
1966. Christmas trees, the tradition and the trade. USDA Agric. Inform. Bull. 94, 31 p.

USDA Forest Service
1974. Seeds of woody plants in the United States. USDA Agric. Handb. 450, 883 p.

U.S. Forest Products Laboratory
1955. Wood handbook. USDA Agric. Handb. 72, 528 p.

Williamson, M. J.
1965. Eastern redcedar (*Juniperus virginiana* L.). *In* Silvics of Forest Trees of the United States, p. 212–216. USDA Agric. Handb. 271.

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